

Appl. No. 10/629,963
Atty. Docket: 2003B071
Amendment dated November 14, 2005
Reply to Office Action mailed August 24, 2005

REMARKS/ARGUMENTS

Claim Amendments

By the amendments presented, Claim 1 is rewritten to incorporate therein the Claim 2 characterization of the liquid oxygenate substantially free of catalyst fines as being selected from methanol and ethanol. In light of this Claim 1 amendment, Claims 2 and 21 are rewritten to direct them to preferred process embodiments wherein the liquid oxygenate substantially free of catalyst fines is methanol. Also in light of the Claim 1 amendment, Claims 6 and 23 are also rewritten editorially to indicate that the methanol and/or ethanol liquid oxygenate free of catalyst fines is "contained in" by-product process water.

Also by the amendments presented herein, apparatus Claims 32-53 are canceled herein without prejudice.

Upon entry of the claim amendments presented, Claims 1-31 remain in the application. No additional claim fee is due as a result of the claim amendments made.

Invention Synopsis

The present invention addresses the problem of removing catalyst fines from the vaporous overhead olefin-containing product which is formed via the catalytic conversion of oxygenates (such as methanol) to olefins. In the present invention, catalyst fines removal is carried out by subjecting this vaporous overhead product to two distinct quenching operations, using two different types of quenching liquids. In a first quenching step, the overhead product stream containing catalyst fines is contacted with a liquid medium containing both water and catalyst fines. In a second quenching step the light, olefin-containing product fraction from the first quenching step is contacted in a second quenching step with a liquid oxygenate which is methanol or ethanol and which is substantially free of catalyst fines. The light product fraction from this second quenching step is then compressed, and the light olefins subsequently recovered therefrom using equipment which would encounter problems if higher amounts of catalyst fines are present in this process stream.

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Restriction Requirement

The Examiner has subjected the present application to a restriction requirement under 35 USC §121 by identifying the following two claim groups:

Group I. Claims 1-31, drawn to a process for converting oxygenate to olefins, classified in Class 585, subclass 639; and

Group II. Claims 32-53, drawn to an apparatus for converting oxygenate to olefins, classified Class 422, subclass 139+

Although this restriction requirement has not yet been made Final following Applicants' previous provisional election of the Group I claims, Applicants are obviating the restriction requirement by canceling the Group II apparatus Claims 32-53 herein. Such cancellation of Claims 32-53 is done without prejudice to Applicants' right to pursue these apparatus claims via one or more divisional applications.

Formal Matters

The Examiner notes that U.S. Patent 6,403,584, listed in Applicants' IDS submitted July 30, 2003, is not pertinent to the present invention and, in fact, was an incorrect citation of U.S. Patent 6,403,854. U.S. Patent 6,403,854 was subsequently correctly cited in a January 19, 2005, IDS and has now been applied in rejection of certain of the claims herein. The Examiner correctly indicates that the erroneously cited '584 patent need not be considered in connection with the examination of this application.

Allowable Subject Matter

In the instant Office Action, the Examiner has indicated that Claim 2 would be allowable if rewritten in independent form. By the amendments presented herein, the subject matter of original Claim 2 has been incorporated into the main independent process Claim 1. It is submitted that this claim amendment thus renders rewritten Claim 1 (and, as indicated hereinafter, the claims dependent from Claim 1) allowable.

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Art Rejection

Originally presented Claims 1 and 3-31 have been rejected under 35 USC §103(a) as allegedly being unpatentably obvious over Miller et al. (U.S. Patent No. 6,403,854, hereinafter "Miller"). Miller discloses an oxygenate to olefins process using a two-stage quench procedure to separate the light olefin product from entrained catalyst fines. As the Examiner notes, however, there is no disclosure or suggestion in Miller to utilize a second quench step employing liquid oxygenates selected from methanol and ethanol (and, as Applicants would note, which are substantially free of catalyst fines) as described in Applicants' original Claim 2, now deemed allowable by the Examiner.

It is submitted that this rejection of Claims 1 and 3-31 herein has been obviated by the incorporation of the indicated allowable subject matter of Claim 2 into main independent Claim 1. Thus amended Claim 1 and Claims 3-31, which directly or indirectly depend therefrom, are unobvious and patentable over Miller for the same reasons that original Claim 2 is allowable over Miller.

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CONCLUSION

Applicants have made an earnest effort to place their application in proper form and to distinguish their claimed invention from the applied prior art. WHEREFORE, reconsideration of this application, entry of the amendments presented, withdrawal of the claim rejection under 35 USC §103, and allowance of the amended Claims 1-31 presented herein, are all respectfully requested.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below

Respectfully submitted,

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